

## REMARKS

The specification has been amended to correct errors of a typographical and grammatical nature. Due to the number of corrections thereto, applicants submit herewith a Substitute Specification, along with a marked-up copy of the original specification for the Examiner's convenience. The substitute specification includes the changes as shown in the marked-up copy and includes no new matter. Therefore, entry of the Substitute Specification is respectfully requested.

The abstract has also been amended to more clearly describe the features of the present invention.

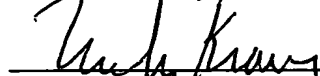
Also submitted herewith is a proposed amendment to the drawings, wherein Figs. 1, 2, 3, 6A, 6B and 9 have been amended at this time. Upon receipt of the approval of the amendment to the drawings and receipt of a Notice of Allowance, the proposed drawing corrections will be effected in accordance with present practice.

Entry of the preliminary amendments and examination of the application is respectfully requested.

To the extent necessary, applicant's petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Case: 503.39860X00) and please credit any excess fees to such deposit account.

Respectfully submitted,

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ABSTRACT

An electric power demand prediction service method and a system therefor may derive an estimated value and/or predicted value of electric power demand of an arbitrary customer group and provide the derived information to electric power suppliers. The electric power demand prediction service method, in supplying an electric power from an electric power supplier to an energy consumer, includes steps of connecting a power supplier supplying an electric power to the energy consumer through a communication circuit, receiving an electric power demand and supply record data measured and collected by the electric power supplier, performing a prediction calculation of the demand power to be supplied from the electric power supplier on the basis of the received record data, delivering the power demand prediction data to the electric power supplier, calculating a charge for the service producing the prediction data to the electric power supplier, and delivering a result of the charge calculation process to the electric power supplier.



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ELECTRIC POWER DEMAND PREDICTION METHOD  
AND SYSTEM THEREFOR

## BACKGROUND OF THE INVENTION

5           The present invention relates to an electric power demand prediction method and a system [therefor] for providing a prediction of an electric power demand, <sup>to be satisfied</sup> under a contract with an electric power supplier or an electric power company.

[Description of the Related Art]

10 Conventionally, prediction of electric power demand is  
carried out  
by predicting a total demand per individual electric  
power company for controlling the power supply by determining the requirements of  
plants bearing a basic and constant power load and power plants, providing  
variable [of] outputs depending upon variation of the power load.  
Thus,  
15 [The] electric power demand prediction has been [thus] performed  
by each individual electric power company independently of the  
others. Furthermore, the prediction is per facility, serviced by the  
electric power company. However, in the environment where  
energy consumers may freely select electric power suppliers  
20 and/or electric power companies for receiving service, the  
conventional manner of prediction and electric power supply  
control cannot be always adapted to electric power conditions.

Conventionally, there is no business entity performing electric power supply services. Therefore, it has <sup>been</sup> merely (be) <sup>the task of</sup> (performed by) each electric power company to predict electric

power demand in each territory for performing electric power supply control. For instance, prediction<sup>has been</sup> <sup>for</sup> ~~is~~ performed electric power demand for<sup>the</sup> next day or week or a predetermined period on the basis of a weather report,<sup>the</sup> day of the week or<sup>a</sup> past record value in the same season <sup>effectively</sup> ~~in the past~~, for <sup>A technique</sup> reflecting to<sup>the necessary</sup> the electric power supply control. ~~The prior art~~ relating to ~~the~~ electric power demand prediction has been disclosed in Japanese Patent Application Laid-Open No. Heisei 11-346438. ~~Disclosed~~ <sup>discloses</sup> ~~(in)~~ The above-identified publication ~~(is)~~, a method for automatically predicting<sup>the</sup> ~~a~~ demand<sup>for</sup> ~~of~~ electric power in a central load dispatching and liaison office. The publication also discusses ~~about~~ a prediction method which is generally applicable for various prediction models, such as<sup>a</sup> <sup>network</sup> feedback type, neural network and so forth.

15 The <sup>techniques</sup> ~~prior art~~ disclosed in the above-identified publication<sup>are directed to</sup> ~~is~~ not electric power demand prediction and control <sup>related</sup> ~~(adapting)~~ to liberalization of<sup>the</sup> power supply. This is not satisfactory in the liberalized environment of<sup>a</sup> power supply. Particularly, under the liberalized environment, electric power

20 supply satisfactory both for the energy consumers and electric power supplier or electric power company cannot be realized unless more precise and more careful prediction and control are performed. Especially, when a business entity of<sup>an</sup> electric power supply service <sup>supplies</sup> ~~performs~~ power ~~(supply)~~ under contract with

25 <sup>various</sup> ~~the~~ energy consumers, proper electric power demand prediction

becomes an important task.

On the other hand, it becomes necessary to obtain<sup>an</sup> estimated value or predicted value of electric power demand per customer group<sup>the</sup> (grouped) per facility of electric power system on the basis of contracts with electric power suppliers, namely, <sup>a</sup> so-called retail business of electric power organized according to liberalization of <sup>the</sup> power supply. Furthermore, if estimation and prediction of <sup>the</sup> demand<sup>for power</sup> is performed per retail seller of electric power, only information <sup>concerning</sup> (of) energy consumers who engage<sup>in a</sup> contract with <sup>a</sup> <sup>is available, which tends</sup> the retail seller to restrict <sup>the</sup> (in) improvement of precision of an estimated value or predicted value.

#### SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide an electric power demand prediction service method and a system therefor, which may derive an estimated value and/or predicted value of electric power demand of an arbitrary customer group and provide the derived information to electric power suppliers (which generally refers to those supplying electric power, including retail sellers of electric power, electric power companies and so forth).

According to <sup>a</sup> the first aspect of the present invention, an electric power demand prediction service method <sup>connection with the</sup> in supplying <sup>of</sup> (an) electric power from an electric power supplier to an energy consumer, comprises the steps of:

*no P* connecting a power supplier, *for* supplying *an* electric power to *an* energy consumer through a communication circuit;

*no P* receiving an electric power demand and supply record data, *which is* measured and collected by the electric power supplier;

5 *no P* performing *a* prediction calculation of *the* demand *for* power to be supplied from the electric power supplier on the basis of the received record data;

*no P* delivering the power demand prediction data to the electric power supplier;

10 *no P* calculating a charge for the service producing the prediction data to the electric power supplier; and

*no P* delivering a result of *the* charge calculation process to the electric power supplier.

According to another aspect of the present invention,  
15 an electric power demand prediction service system *connection with the* in supplying *of* *an* electric power from an electric power supplier to an energy consumer, comprises:

a demand prediction service center including: *an*

electric power demand and supply record data receiving  
20 portion connected with a power supplier *for* supplying *an* electric power to the energy consumer through a communication circuit, and receiving an electric power demand and supply record data *which is* measured and collected by the electric power supplier; *a*

*predicting* portion performing prediction calculation of *the*  
25 demand power to be supplied from the electric power supplier

on the basis of the received record data; <sup>a</sup>  
<sup>no RP</sup> delivering portion <sup>for</sup> delivering the power demand prediction  
data to the electric power supplier; <sup>a</sup>  
<sup>no RP</sup> charge calculation processing portion <sup>for</sup> calculating a  
5 charge for the service producing the prediction data to the  
electric power supplier; and <sup>a</sup>  
<sup>no RP</sup> delivering portion <sup>for</sup> delivering a result of <sup>a</sup> charge  
calculation process to the electric power supplier, for  
providing the prediction data of the demanded power to the  
10 electric power supplier.

In the preferred construction, the demand prediction  
service center may perform prediction of the demanded power  
using demanded power prediction data held by the electric power  
supplier or <sup>the</sup> database of <sup>an</sup> external organization in addition to <sup>the</sup>  
15 power demand and supply record data. The demand prediction  
service center may cumulatively store demanded prediction data  
for the electric power supplier in a customer data file and  
make reference to the customer data file upon demand prediction.  
The demand prediction service center may be <sup>a</sup> [the] predicting  
20 portion which performs prediction of demanded power on the basis  
of reception [signal] of a load survey data or distribution line  
measurement data of the electric power supplier or a result  
of cluster analysis of <sup>a</sup> load curve record value. The charge  
processing portion to the electric power supplier in the demand  
25 prediction service center may be a charge processing portion

determining a charge to a customer on the basis of at least one of precision of prediction, size of <sup>geographic</sup> [geometric] area, length of prediction period, time interval of prediction per se, and size of electric power variation amount in the load curve in  
5 a prediction time zone.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood more fully from the detailed description given hereinafter and from the  
10 accompanying drawings of the preferred embodiment of the present invention, which, however, should not be taken to be limitative to the invention, but are <sup>provided only</sup> for explanation and understanding of the principles of the invention <sup>only</sup>.

In the drawings:

15 Fig. 1 is a block diagram showing <sup>the</sup> [a] overall construction of a prediction service system according to the present invention, which includes a demand prediction service center;

Fig. 2 is a block diagram <sup>showing the</sup> [of a] construction of a demand prediction service center according to the present invention;

20 Fig. 3 is <sup>a block diagram</sup> [an illustration] showing one example of <sup>the</sup> [a] structure of <sup>a</sup> database on the <sup>side</sup> [side of] customer;

Fig. 4 is <sup>a table illustrating</sup> [an illustration for explaining a] predicted data obtained per <sup>kind</sup> [kind] of contract;

Fig. 5 is <sup>a flowchart</sup> [an illustration] showing a general flow of <sup>the</sup> demand prediction process <sup>carried out</sup> in the prediction service center;  
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Fig. 6A is a <sup>table and Fig. 6B is a diagram illustrating</sup> [general explanatory illustration for] <sup>[explaining]</sup> a demand predicting method;  
<sup>Figs 7A and 7B are time diagrams showing</sup> [Fig. 7 shows] one example of the result of demand prediction;  
<sup>Diagram illustrating</sup> Fig. 8 is a general [explanatory illustration of] a data  
5 file of <sup>a</sup> customer (electric power supplying business entity)  
held by the prediction service center;  
Fig. 9 is a flowchart showing one example of <sup>an</sup> accounting  
process; and  
<sup>a table</sup> Fig. 10 is <sup>an</sup> [an illustration] showing <sup>an</sup> [a] accounting objective  
10 prediction condition for a predetermined period per electric  
power supplying business entity.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will be <sup>described</sup> [discussed] hereinafter in  
15 detail in terms of <sup>a</sup> [the] preferred embodiment of the present  
invention with reference to the accompanying drawings. In the  
following description, numerous specific details are set forth  
in order to provide a thorough understanding of the present  
invention. It will be obvious, however, to those skilled in  
20 the art that the present invention may be practiced without  
these specific details. <sup>On</sup> [In] <sup>hand</sup> other [instance], well-known  
structures <sup>are</sup> not shown in detail in order to avoid unnecessary  
obscurity of the present invention.

Fig. 1 is a block diagram showing the overall construction  
25 of a demand prediction service system according to the present

invention. The reference numeral 10 denotes an electric power demand prediction service center <sup>which</sup> (or) may also be referred to as an electric power demand prediction business entity). (A) <sup>6</sup> construction of the electric power demand prediction service center will be discussed later. The electric power supply business entities include those identified by PSa to PSn. DBa to DBn identify databases respectively held by the electric power supply business entities PSa to PSn, in which data necessary for demand prediction is stored. Thus, among data stored in <sup>each</sup> (the) database, necessary data for predicting electric power demand is provided to the demand prediction service center 10. Among data stored in the database, <sup>there is</sup> (it includes) prediction data predicted by the electric power supply business entity independently. Then, such prediction data is configured to be used by the service center as (a) basic data.

PSn (n = a to n) identifies the electric power supply business entity, including (the) electric power companies, retail sellers of electric power, such as electric power service business entities, <sup>which have a</sup> (having) contract with the electric power company or other electric power supply business entity. Irrespective of <sup>the</sup> scale of the business entities, the electric power supply business entity, <sup>the</sup> controlling supply power depending upon predicted demand of the electric power, is a target of <sup>the</sup> (the) service. The reference numeral 16 denotes (a) energy consumers <sup>entity</sup> (L). To the electric power supply business <sup>entity</sup> (entry) PSa, an energy

consumer group 16a is connected for receiving <sup>a given</sup> [service of] electric power in accordance with <sup>a</sup> contract. The reference numeral 16b denotes an energy consumer group receiving [service of] electric power from the electric power supply business entity PSb.

5 Similarly, the reference numeral 16n denotes an energy consumer group receiving service of electric power from the electric power supply business entity PSn. The reference numeral 18 denotes a communication circuit, such as <sup>the</sup> internet, to be used for sending <sup>a</sup> request <sup>for</sup> [of] electric power demand prediction, <sup>a</sup> providing data, providing the result of <sup>a</sup> prediction, delivery <sup>a</sup> of <sup>a</sup> bill for charges, other demands and so forth between the electric power supplier and the electric power demand prediction service center 10. For example, in <sup>the</sup> case of <sup>the</sup> entity <sup>a</sup> PSa, 20a represents <sup>a</sup> transmission channel for delivery <sup>a</sup> prediction result data to <sup>the</sup> entity <sup>a</sup> PSa and 20b represents <sup>a</sup> transmission channel for sending data and <sup>a</sup> request for prediction of demand and other requests <sup>a</sup> from <sup>the</sup> entity <sup>a</sup> PSa to the service center 10. Similarly, signal lines 20b to 20n and 22b to 22n are <sup>provided on</sup> channels to be used for communication between respectively corresponding electric power suppliers <sup>a</sup> and the service center 10.

The reference numeral 14 denotes <sup>a</sup> database of an external organization to be accessed when data of <sup>the</sup> external organization is used as <sup>an</sup> auxiliary data. In this case, databases of the external organizations are identified by DBel to DBej. The <sup>a</sup> database of <sup>a</sup> external organization may include <sup>a</sup> database of <sup>a</sup> public

agency and so forth. Data to be obtained from the database of the external organization<sup>[ ]</sup> may <sup>relate to</sup> be <sup>an</sup> weather<sup>[ ]</sup> or electric power demand record of <sup>a</sup> local area or <sup>the</sup> whole country <sup>for a</sup> <sup>period of time</sup> in the past, and so forth. The reference numeral 24 denotes a communication circuit, such as <sup>the</sup> internet, similar to the communication circuit 18 and <sup>is</sup> to be used for obtaining data from <sup>an</sup> external organization, as required. It should be appreciated that use of the database of the external organization is not essential for <sup>a</sup> certain prediction service center of <sup>a</sup> certain function.

10 Fig. 2 shows <sup>the</sup> (a) construction of <sup>a</sup> (the) demand prediction service center 10, which is constructed with <sup>a</sup> microcomputer and so forth. The reference numeral <sup>denotes</sup> 38 <sup>(is)</sup> a customer information authentication and management portion, which receives signals 22a to 22n from the customer (in this case, electric power  
15 supplier), performs authentication by checking whether the customer <sup>an</sup> (in access) is <sup>determines the</sup> authorized customer under contract, <sup>a</sup> contract condition and so forth, on the basis of <sup>a</sup> password or the like input by the customer, and performs management <sup>processing</sup> [process] <sup>by</sup> using a customer information management file 42 <sup>for</sup> [with] updating  
20 customer data <sup>in</sup> [for] preparation <sup>for</sup> [to] the next request for prediction.

The reference numeral 34 denotes <sup>a</sup> an accounting portion <sup>the</sup> for performing charge calculation for prediction service. The accounting portion performs charge calculation using data in a charge data file 46 depending upon <sup>the</sup> requesting condition of  
25 prediction within a given period. The reference numeral 32

denotes an external data managing portion which is active when data provided by the customer is not sufficient for satisfying a condition for performing<sup>a</sup> prediction requested by the customer and when judgment is made that data from the external organization may satisfy the requested precision of the demand prediction. The external data managing portion 32 will then access the external database, such as<sup>the</sup> data base of<sup>a</sup> public agency (or private organization) to obtain necessary information. The external data managing portion 32 also manages<sup>the accessing</sup> obtaining of data and stores the obtained data in an external data file for re-use in the future.

Accordingly, when corresponding data is not stored in the file 44, data is newly obtained from the external organization. For example, in Fig. 2, if data is lacking in the data file 48 from the customer, the accumulated data file 44 of the external data is assessed for newly obtaining<sup>the</sup> necessary data. If data is still lacking after accessing the accumulated data file 44, the database of the external organization is accessed for newly obtaining<sup>the</sup> necessary data. In such<sup>a</sup> case, use of the accumulated data file and access to the database of<sup>the</sup> external organization and so forth are taken into account in<sup>the</sup> accounting process. In general, use of the accumulated data file and access to the database of<sup>the</sup> external organization and so forth<sup>will</sup> become necessary<sup>a</sup> (upon lacking<sup>in the absence</sup>) of relatively new data or when data at<sup>a</sup> different viewpoint is desired for predicting operation. The reference

numeral 40 denotes a predicting operation processing portion<sup>for</sup> performing<sup>the</sup> actual predicting operation using data obtained as set forth above. The predicting operation processing portion 40 includes various prediction libraries, such as a numerical value processing library, a clustering analysis library, a domestic power consumption model analysis library and so forth, which may significantly influence <sup>the</sup> ~~for~~ <sup>the</sup> quality of prediction data of the demand prediction service center 10. The reference numeral 50 denotes a display device provided in the service center 10 for displaying<sup>the</sup> result of prediction or<sup>the</sup> process of<sup>a</sup> predicting operation. The display device 50 is used for checking information before transmitting prediction data to the electric power supplier and for other purposes<sup>a</sup>.

Fig. 3 is<sup>a block diagram</sup> ~~an explanatory illustration~~ showing one example of a construction on the side of the electric power supplier. Fig. 3 shows<sup>an example</sup> ~~the case~~ <sup>a</sup> of a PSa. It should be noted that the construction ~~in~~ <sup>for</sup> each individual electric power supplier is not necessarily the same as that of<sup>the</sup> a PSa as illustrated. Each electric power supplier<sup>will</sup> often have<sup>its</sup> own database. As shown in Fig. 3, <sup>a value representing an amount of</sup> ~~an~~ electric power <sup>is provided by the device</sup> ~~consuming amount measuring value~~<sup>and</sup>, 52 of the end customer (energy consumer) is transmitted to the database of the electric power supplier through a communication circuit 54. On the other hand, the reference numeral 60 denotes a distribution transformer feeder transmission measuring device connected to the power supplier side through a communication

circuit 62 for inputting a measured value. On the power supplier side, the measured value is cumulatively stored in the database (e.g. DBa) of the power supplier through <sup>the</sup> communication processing <sup>portion</sup> 56.

5           The reference numeral 58 denotes a customer demand cluster analyzing portion, which <sup>receives</sup> [takes] an input signal, such as <sup>a</sup> load curve record value measured by the customer or the general information of the customer, <sup>an</sup> to perform analysis. A signal 67 indicative of <sup>the</sup> result of analysis is input and stored <sup>in</sup> [to] the database 12 (DBa). Thus, the data base on the side of the power supplier not only holds the measured data <sup>a</sup> ~~per se~~ as data base, but also stores the result of analysis on the side of the customer. On the other hand, for the customer having no measuring device, a result estimated from general information is stored in the database. As set forth above, <sup>the database</sup> DBa, for example, is [a database] 15 unique for the customer. <sup>A</sup> Predicting operation is performed in the prediction service center <sup>by</sup> [with] effectively using data stored, as set forth above, for further precise prediction. Data necessary for prediction from <sup>the</sup> data of <sup>the database</sup> the DBa is fed to the demand prediction service center 10 shown in Fig. 1 to receive 20 the predicted result <sup>, thereby</sup> to perform power generation control.

Fig. 4 shows an example of <sup>a</sup> demand prediction contract between the demand prediction service center 10 and the power supplier. In the demand prediction service center 10, <sup>a</sup> demand prediction service is performed depending upon <sup>the</sup> content of <sup>the</sup> the

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contract with the power supplier. Here, there is shown an example [of the case] <sup>there are various</sup> where <sup>the</sup> kinds of contracts [are] A to S. For example, a contract A includes data provided from the power supply business entity, which represents <sup>itself,</sup> presence of analysis data of the power supplier, <sup>represents a</sup> [own] including the measured data. A contract C <sup>so</sup> [is the] case where no data can be provided, and data of the external organization has to be relied <sup>on</sup>. In Fig. 4, the item next to the contract item is the item indicative <sup>of</sup> whether the external database has to be used for satisfying <sup>a</sup> demand of the demand prediction or not. In the contract A, the database of the external organization is used under contract. Namely, the second item indicates whether the database of the external organization is to be used, when the data provided by the electric power supplier or the electric power supply business entity is lacking for satisfying the prediction demand. The contract B does not use the data of the external organization and performs prediction based on the data provided from the electric power supplier, the data held by the prediction service center, know how of prediction, tools <sup>A</sup> of prediction and so forth.

20 The items next to the second item represent <sup>the</sup> prediction period. Namely, the item in question <sup>indicates</sup> [is] whether the demand period is only long term or short term. In the <sup>illustrated</sup> [shown] example, the contract A is <sup>for</sup> only short period prediction. On the other hand, the contract B represents <sup>an example in which</sup> [that] the requested prediction <sup>a</sup> is only long term prediction. The items next to the prediction

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period items concern<sup>the</sup> predicting region. This item indicates whether the prediction has to be made for a designated area, <sup>the entire</sup> <sup>a</sup> [all] area or for <sup>a</sup> particular energy consumer, among energy consumers being supplied <sup>with</sup> [the] electric power from the electric power supplier. Under the contract A, in addition to a prediction for the particular area, demand prediction information for the overall area has to be supplied to the electric power supplier. On the other hand, the contract S has a content requiring prediction for all items, namely for all

10 of the particularly designated areas, the overall area and <sup>a</sup> particular energy consumer. <sup>This is an example of</sup> <sup>a</sup> [These are] only basic contract, and the customer (electric power supplier) may receive prediction service beyond the content of <sup>this basic</sup> <sup>a</sup> contract<sup>a</sup>. In such case, <sup>a</sup> charge will be considered in <sup>the</sup> accounting.

15 Fig. 5 is a process flowchart <sup>of the processing</sup> in the service center 10 in the case where <sup>a</sup> predicting operation is performed <sup>ed</sup> ~~was~~ according to <sup>a</sup> <sup>a</sup> [the] request for <sup>a</sup> demand of prediction. At step S12 (e.g., 20a), authentication is performed <sup>to determine</sup> whether the power supplier requesting <sup>a</sup> prediction is <sup>authorized</sup> [has authority] under contract or not

20 by checking <sup>the</sup> password or the like. Also, at step S12, the content of <sup>the</sup> contract is also checked for the electric power supplier for which authentication is successful. Next, at step S14, <sup>a</sup> [a] <sup>the</sup> condition of demand prediction is checked. For example, <sup>a</sup> check is performed for the period of <sup>the</sup> prediction under contract, <sup>the</sup> required precision, <sup>the</sup> necessary data for <sup>the</sup> required precision and

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so forth as the condition for prediction. Then, at step S16,<sup>a</sup>  
check is performed<sup>to determine</sup> whether data is sufficient for making<sup>a</sup>  
prediction satisfying the demand of the power supplier. If the  
conditions set forth above are satisfied<sup>the</sup>, predicting operation  
is performed<sup>by</sup> selecting<sup>a</sup> [the] prediction method among a  
5 plurality of prediction methods or selection of<sup>a</sup> [the] prediction  
method is performed at step S18. Namely, in<sup>the</sup> selection at step  
S18, whether the required precision of prediction can be<sup>achieved</sup> [made],  
by only correction of the existing prediction pattern, by  
10 complicated<sup>is determined</sup> converging calculation or so forth adapting to demand  
of the customer<sup>a</sup>. Then, at step 20, a particular predicting  
operation is performed.

Fig. 6A shows an example of the prediction method. For  
example, (1) when the customer (here, the power supplier is  
15 referred to) monitors<sup>the</sup> power supply amount, a prediction is  
performed using on-line data resulting from monitoring<sup>a</sup>; (2)  
when the customer monitors<sup>the</sup> power supply amount, a prediction is  
performed using the result of clustering analysis made by the  
customer and [the] general information<sup>a</sup>; (3) is [the] case where  
20 prediction is performed using<sup>a</sup> past record<sup>a</sup>; (4) is a [the] case  
where prediction of total demand is performed on the basis of  
load prediction value per group<sup>;</sup> and<sup>a</sup> (5) is [the] case of prediction  
per particular period, which is the case<sup>where a</sup> [to perform] prediction<sup>is performed</sup>  
with respect to the period R<sup>B</sup>, as shown in Fig. 6. The predicting  
25 method will be selected<sup>according</sup> [adapting] to respective cases.

At step S22, evaluation and correction is effected for  
the result of <sup>a</sup>predicting operation. For example, in evaluation  
and correction, <sup>a</sup>check is performed <sup>to determine</sup> whether the predicted pattern  
is not significantly differentiated from the past predicted  
5 pattern or whether the predicted pattern is quite similar to  
the past predicted pattern. Evaluation and correction may be  
<sup>carried out</sup> <sup>of</sup> <sup>done</sup> with display ~~the~~ the predicted pattern on a display device  
at display step S24. At step S26, the result of prediction is  
transmitted to the customer (electric power supplier). At step  
10 S28, the result of prediction is held as <sup>a</sup>database for use in  
the next predicting operation.

On the other hand, if <sup>a</sup>judgment is made that data is lacking  
for the predicting operation <sup>which is</sup> <sup>missing</sup> <sup>as</sup> checked at step S16, the <sup>lacking</sup> <sup>data</sup>  
data is obtained from the customer (power supplier) at step  
15 S30. On the other hand, at step S32, <sup>a</sup>judgment is made <sup>to determine</sup> whether  
data taken from the external organization can be used for  
prediction or not. If the data obtained from the external  
organization can be used, <sup>a</sup>check is performed <sup>to determine</sup> whether all data  
necessary for <sup>a</sup>predicting operation <sup>has been</sup> <sup>are</sup> obtained <sup>or not</sup> at step  
20 S36. If <sup>a</sup>judgment is made that all necessary data <sup>has been collected</sup> <sup>is corrected</sup>, <sup>a</sup>  
predicting operation is performed at step S18 and subsequent  
steps. Correction for precision or so forth to be performed  
at step S38 is effected when the demanded precision of <sup>the</sup> prediction  
data cannot be obtained by data obtained from the external  
25 database. In such <sup>a</sup> <sup>a</sup>case, <sup>a</sup>predicting operation is executed with

<sup>correction of</sup>  
1 <sup>^</sup> [correcting] the precision to the level to be achieved by the  
given data or <sup>correction of</sup> [correcting] the prediction period. At step S32,  
when judgment is made that the already obtained external data  
is not useful, data is again obtained from the external database.

5 Of course, such <sup>an</sup> effort should be taken into account <sup>during the</sup> [upon],  
accounting process.

<sup>a</sup>  
Figs. 7A and 7B show <sup>a</sup> particular example of the result  
of <sup>a</sup> predicting operation. Fig. 7A shows the result of prediction  
per week, <sup>as well as</sup> [and shows] an average demanded power amount predicted  
10 per week and per days of the week. On the other hand, Fig. 7(B)  
shows a result of prediction (P1) effected per hour of <sup>the</sup> day  
(twenty-four hours) and also shows an average demand power amount  
(P2) at <sup>intervals</sup> [every] four hours <sup>portion</sup>. <sup>a</sup> (a) in Fig. 7(B) shows the average  
power amount at <sup>intervals</sup> [every] four hours <sup>portion</sup>, and (b) shows the predicted  
15 value of the average demand power amount at <sup>intervals</sup> [every] one hour.

Fig. 8 shows an example of a graph of the customer data  
file data. The lateral axis represents a time axis in <sup>general</sup> [broad]  
[meaning] and including <sup>the</sup> hour, <sup>the</sup> week and so forth. In Fig. 8, <sup>portion</sup> (a)  
<sup>illustrates</sup> [is] the past power demand pattern per <sup>the</sup> electric power supplier  
20 and is a demand prediction pattern per week, as shown in Fig.  
7A, <sup>a</sup> or demand prediction for a day (twenty-four hours) or other  
various load demand model patterns. Such <sup>a</sup> load demand model  
pattern is stored <sup>so as</sup> to be made reference to upon subsequent demand  
prediction for improving <sup>the</sup> precision <sup>of a</sup> [in] demand prediction, <sup>thereby</sup>  
25 shortening <sup>the</sup> [of] operation period of the demand prediction. <sup>portion</sup> (b)

of Fig. 8 shows, <sup>a</sup> <sup>representing a</sup> model <sup>(as)</sup> common demand pattern in the power suppliers PSa to PSn to be used for any of power suppliers. By making <sup>reference to such</sup> <sup>(these)</sup> data <sup>(reference to)</sup>, precise prediction can be done quickly. <sup>(Models for)</sup> <sup>in</sup> the case where it is desired to perform pattern correction <sup>with a</sup> <sup>at</sup> different viewpoint, or when <sup>a</sup> power demand pattern of the power supplier is to be predicted, the models of the patterns are stored for use.

Fig. 9 is a flowchart <sup>illustrating a</sup> <sup>(for explaining)</sup> charging operation. At step S42, the case of <sup>a</sup> <sup>(the)</sup> predicting operation in the predetermined period of the customer is picked up. For example, as shown in Fig. 10, <sup>a</sup> predicted information providing condition for a predetermined period per the power supplier is derived. Then, on the basis of such record, <sup>an</sup> accounting process for the predetermined period is performed.

At step S44, <sup>a</sup> <sup>as to</sup> judgment is made, whether the picked-up case of predicting operation <sup>a</sup> <sup>for</sup> <sup>(of)</sup> the customer falls within the range of <sup>the</sup> contract or not. If the picked up case of <sup>the</sup> prediction operation falls within the range of <sup>a</sup> contract, <sup>a</sup> charge calculation is performed according to the contract at step S46. However, <sup>(in)</sup> <sup>for</sup> some <sup>(of the)</sup> customers, all of the cases of <sup>a</sup> prediction operation may not fall within the range of <sup>the relevant</sup> contract. If some cases of <sup>a</sup> prediction operation fall <sup>outside</sup> <sup>(out)</sup> of the contract, the total charge to be billed to the customer may be derived <sup>while</sup> <sup>(with)</sup> taking <sup>(the)</sup> <sup>an</sup> extra service into account at step S60, at which the total charge is displayed per customer and <sup>the</sup> charge file is updated. On the

other hand, some customer may have <sup>a</sup> [the] contract for a fixed  
[amount] charge to be billed at step S46.

If judgment is made that some prediction operation does  
not fall within the contract as <sup>determined</sup> [checked] <sup>a</sup> at step S44, <sup>a</sup> check is  
<sup>to determine</sup> performed, whether data is obtained from <sup>an</sup> [the] external database  
5 out of <sup>the</sup> contract at step S48. At step S50, <sup>a</sup> check is made <sup>to determine</sup> what  
modification has been made with respect to the content of <sup>the</sup> contract.  
For example, when the area to perform <sup>the</sup> prediction operation is  
modified with respect to the initially set area, <sup>a</sup> check is made  
10 at step S52. When the area is modified <sup>by</sup> <sup>to</sup> expanding or  
contracting the area as <sup>determined</sup> [checked] at step S52, such modification  
of the area is reflected <sup>in the</sup> [upon] charge calculation at step S58.  
On the other hand, at step S54, it is also checked <sup>to determine</sup> whether <sup>the</sup> kind  
of business <sup>perform the</sup> to <sup>make</sup> prediction operation is changed or not.  
15 If the kind of business is changed, <sup>this</sup> <sup>the</sup> [the] fact is reflected upon <sup>the</sup>  
charge calculation at step S58. Change of <sup>the</sup> kind of business means  
that <sup>the</sup> power demand prediction of <sup>the</sup> manufacturing industry is  
initially requested, and <sup>a</sup> subsequently <sup>a</sup> demand prediction  
including complex housing is requested, or <sup>a</sup> subsequently <sup>a</sup> request  
20 is changed to prediction of the complex housing, for example.  
At step S56, <sup>a</sup> <sup>to determine</sup> check is performed <sup>the</sup> whether <sup>a</sup> prediction period has  
been changed or not. For example, modification from <sup>a</sup> short period  
<sup>a</sup> to <sup>a</sup> long period or <sup>a</sup> change of season <sup>for a</sup> [among] <sup>a</sup> short period and any  
change <sup>of</sup> <sup>the</sup> [for] frequency of <sup>the</sup> initial prediction may be checked at  
25 step S56. Then, any change of the prediction frequency is

reflected <sup>in the</sup> [to] charge calculation.

As set forth, at step S60, for some customers, part of <sup>the</sup> service may fall <sup>outside</sup> [out] of the contract. In such <sup>a</sup> case, <sup>the</sup> total charge to be billed is calculated <sup>to include</sup> [with including] the charge for the

- 5 service within the contract and the extra charge for the service <sup>outside the</sup> [out] of contract. At step <sup>S62, a</sup> check is performed <sup>to determine the</sup> whether charge calculation is completed for all customers.

It is possible that some of the customers form a group <sup>so as</sup> to be a single customer. Also, the customer can be a power supply

- 10 service business entity. All of such customers may be simply <sup>dealt with</sup> a [deal] as customer. If special treatment is required, necessary special treatment will be handled in <sup>the</sup> [a] content of the contract to reflect such special treatment in calculation of <sup>the</sup> charge. Also, when <sup>a</sup> database of the external organization is used, such <sup>a</sup> charge portion may be pointed out to the customer.

- Also, in the charge calculation process, consideration will be <sup>given to</sup> made for <sup>a</sup> the case where <sup>depends the</sup> charge <sup>will</sup> [depending upon] precision level of <sup>a</sup> prediction, namely, higher precision <sup>a</sup> result in higher charge, or where prediction can be made <sup>simply by</sup> [with only] modification
- 20 of the prediction data provided by the power supplier. Also, when the load prediction pattern is similar to that of other power suppliers, <sup>it is possible a</sup> to perform <sup>a</sup> correcting prediction based thereon. <sup>By</sup> [With] making reference to the prediction pattern of a plurality of power suppliers, prediction data with <sup>a</sup> higher precision may
- 25 be provided.

*in accordance*

As set forth above, <sup>*in accordance*</sup> with the present invention, since the electric power supplier may preliminarily engage with the demand prediction service center under contract and provide data necessary for prediction, <sup>*determining*</sup> (an) appropriate prediction data can be obtained for efficiently <sup>*determine*</sup> control demand and supply. On the other hand, since the demand prediction service center has a <sup>*charge*</sup> [charge] system to <sup>*a*</sup> the electric power supplier through <sup>*a*</sup> charge calculation process depending upon provided prediction data, substantial effect can be achieved in billing.

10 Although the present invention has been illustrated and described with respect to <sup>*an*</sup> exemplary embodiment thereof, it should be understood by those skilled in the art that the foregoing and various other changes, omissions and additions <sup>*^*</sup> may be made therein and thereto, without departing from the spirit and scope of the present invention. Therefore, the present invention should not be understood as limited to the specific embodiment set out above, <sup>*is intended*</sup> but <sup>*is intended*</sup> to include all possible embodiments which can be embodied within a scope encompassed and equivalent thereof with respect to the features <sup>*^*</sup> set out in

20 the appended claims.